The

HORMONE HANDBOOK

First Edition

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Table of Contents

Foreword **3**
Basic Endocrinology **4**
Androgens 5
Testosterone (T) 5
Dihydrotestosterone (DHT) 5
Androgenic Effects in Trans People 5
Androgenic Side Effects 5
Oestrogens 6
Estrone (E1) 6
Estradiol (E2) 6
Oestrogenic Effects in Trans People 6
Oestrogen's Side Effects 6
Progesterone (P4) 7
Terminology 7
Progestogenic Effects in Trans People 7
Progestogenic Side Effects 7
Negative Feedback 8
Neurohormones 8
Gender Affirming Hormone Therapy **9**
For Those Who Wish to Masculinise 10
Masculinising Hormone Therapy Regimes 11
Masculinising Medication Doses 12
Testosterone Doses 12
Other Affirming Medication Doses 12
Examples of Masculinising Hormone Regimes 13
Example 1: GP Administered Testosterone Injections 13
Example 2: Self Administered Testosterone Injections 13
Example 3: Testosterone Patches and Progesterone Cream 14
Example 4: Testosterone Gels and Creams 14
For Those Who Wish to Feminise 15
Feminising Hormone Therapy Regimes 16
Feminising Medication Doses 18
Oestrogen Doses 18
Anti-androgen Doses 18
Progestogen Doses 19
Other Affirming Medication Doses 19
Examples of Feminising Hormone Regimes 20
Example 1: Oral Oestrogens and Spironolactone 20
Example 2: Oestrogen Patches and Cyproterone Acetate 20
Example 3: Injectable Oestrogens and Bicalutamide 21
Example 4: Oestrogen, SERMs and Finasteride 21

Self-injection Guidelines **22**
How to Inject Androgens 23
Supplies for Intramuscular (IM) Injections 23
Steps for Intramuscular (IM) Injections 23
How to Inject Oestrogens and Progestogens 24
Supplies for Subcutaneous (SC) Injections 24
Steps for Subcutaneous (SC) Injections 24
Hormone Medications **25**
Androgenic Medications 26
Testosterone Topical Gels 26
Testosterone Patches 26
Testosterone Implants 27
Injectable Testosterone 27
Oestrogenic Medications 28
Oral Oestrogens 28
Oestrogen Topical Gels 28
Oestrogen Patches 29
Oestrogen Implants 29
Injectable Oestrogens 30
Progestogenic Medications 31
Oral and Rectal Progesterone 31
Progesterone Topical Gels 31
Progestin Implants 32
Injectable Progestogens 32
Anti-Androgens **33**
Spironolactone 34
How Spironolactone Works 34
Spironolactone Pros, Cons and Side Effects 34
Spironolactone Tips and Cautions 34
Cyproterone Acetate 35
How Cyproterone Acetate Works 35
Cyproterone Acetate Pros, Cons and Side Effects 35
Cyproterone Acetate Tips and Cautions 35
Bicalutamide 36
How Bicalutamide Works 36
Bicalutamide Pros, Cons and Side Effects 36
Bicalutamide Tips and Cautions 36
Finasteride and Dutasteride 37
How Finasteride and Dutasteride Work 37
Finasteride and Dutasteride Pros, Cons and Side Effects 37
Finasteride and Dutasteride Tips and Cautions 37

GnRH Analogues....38
How GnRHa's Work....38
GnRHa Pros, Cons and Side Effects....38
GnRHa Tips and Cautions....38
Selective Oestrogen Receptor Modulators....39
Raloxifene....40
How Raloxifene Works....40
Raloxifene Pros, Cons and Side Effects....40
Raloxifene Tips and Cautions....40
Tamoxifen....41
How Tamoxifen Works....41
Tamoxifen Pros, Cons and Side Effects....41
Tamoxifen Tips and Cautions....41
Clomiphene....42
How Clomiphene Works....42
Clomiphene Pros, Cons and Side Effects....42
Clomiphene Tips and Cautions....42
Further Resources....43
Australian Resources....43
International Resources....43

Foreword

This handbook describes the medications and treatment regimes available to trans and gender diverse people. It aims to demystify the medical aspects of transitioning and allow its readers to make informed decisions about gender affirming hormone therapy. It also aims to assist with self-managing therapy and communicating with healthcare professionals about medical care decisions.

DISCLAIMER:

Please discuss all medications and regimes with a GP and/or endocrinologist before starting or changing medications and/or doses, and always read the consumer medicines information (CMI) leaflet before taking any medication.

Chapter 1

Basic Endocrinology

Endocrinology is Greek for “the study of hormones”, and this chapter introduces the major hormones involved in gender affirming hormone therapy (androgens, estrogens and progestogens) and discusses their functions in both cis and trans bodies.

Hormones are chemical signals that are produced by parts of the brain, thyroid, liver, adrenal glands, kidneys, pancreas and gonads (i.e. testes and ovaries). These organs release hormones into the bloodstream to send instructions to the body’s cells about how to behave.

Hormones can also be taken as medications to change the way cells in the body behave, which is how gender affirming hormone therapy is able to change the body’s characteristics to better align with a person’s gender identity.

Androgens

Androgens (Greek for “masculinising hormones”) are a group of hormones including testosterone (T) and dihydrotestosterone (DHT), that are produced by the skin, adrenal glands, ovaries, testes and prostate. Androgens are abundant in XY males and induce masculine secondary sexual characteristics. They’re also involved in sperm production in people with testes.

Testosterone (T)

This is a **weaker** androgen which is found in nearly all androgenic medications used for GAHT. For XY males and people taking androgenic medications, testosterone will be the most abundant androgen in the bloodstream. A small portion (~10%) of the testosterone will be converted into a much stronger androgen called dihydrotestosterone (DHT).

Dihydrotestosterone (DHT)

This is a **very strong** androgen made when the enzyme 5a-reductase modifies testosterone in the skin, prostate and liver. DHT is responsible for beard and body hair growth, and scalp hair loss. To avoid scalp hair loss many people choose to block DHT’s effects with a 5a-reductase inhibitor like finasteride or dutasteride.

Androgenic Effects in Trans People

Transmasculine	Transfeminine	During Puberty
Causes infertility Increases muscle mass Redirects fat toward abdomen (away from butt, thighs and breasts) Changes body odour Deepens voice and causes Adam’s apple growth Initiates beard and body hair growth Makes skin oily and acne prone May cause scalp hair-loss (male pattern baldness) Increases libido Causes clitoral growth but may cause atrophy of surrounding developmentally feminised genitalia May stop or deregulate menstruation	Topical gels or creams can alleviate dryness and atrophy of developmentally masculinised genitalia	Masculine skeletal development (including taller stature and larger hands and feet) Improved body and facial hair growth Increased genital growth

Androgenic Side Effects

Common	Uncommon	Rare
Increased risk of heart disease, high cholesterol, high blood pressure, fat deposition around organs, weight gain/obesity, headaches/migraines, mood swings	Type 2 diabetes, erythrocytosis (excessive red blood cell production) causing stroke/heart attack	Liver disease

Note: These side effects will be the same for androgenic medications

Oestrogens

Oestrogens (Greek for “frenzying hormones”) are a group of hormones including Estrone (E1) and Estradiol (E2), that are produced by the fat cells (adipose tissue), adrenal glands, ovaries and testes. Oestrogens are abundant in XX females and induce feminine secondary sexual characteristics. They’re also involved in ovulation, menstruation and pregnancy for people with ovaries and uteruses. While oestrogens may affect mood, rest assured they will not induce “frenzy”.

Estrone (E1)

This is a **weaker** oestrogen made by altering estradiol (E2) in the liver. For people taking oral (swallowed) estrogens, E1 may be more abundant in the blood than E2 because most of the E2 in oral estrogens is converted into E1 by the liver before it enters the bloodstream and circulates around the body. This can be avoided by using non-oral forms of oestrogen.

Estradiol (E2)

This is a **stronger** oestrogen which is found in nearly all oestrogenic medications used for GAHT. Estradiol (E2) is quickly converted into the weaker version estrone (E1) by the liver. However, for people taking oestrogen injections, implants, patches, gels and/or suppositories (i.e. non-oral oestrogens), E2 may remain more abundant in the blood than E1 because it circulates around the body before it reaches the liver and is converted into E1.

Oestrogenic Effects in Trans People

Transmasculine	Transfeminine	During Puberty
Topical gels or creams can alleviate dryness and atrophy of developmentally feminised genitalia	Causes infertility Starts breast growth Redirects fat toward butt, thighs and breasts (away from abdomen) Makes scalp hair softer, less oily and slows or stops male-pattern hair loss Softens skin, reduces acne Changes body odour Reduces body hair Decreases libido May cause atrophy of developmentally masculinised genitalia	More pronounced and complete breast development and fat redistribution Feminine skeletal development (including hip widening) Reduced genital growth

Oestrogen’s Side Effects

Common	Uncommon	Rare
Nausea, indigestion, bloating, weight changes, breast tenderness, headaches and leg cramps	Deep Vein Thrombosis (DVT) (blood clot in the legs)	Pulmonary Embolism (PE) (when blood clots in the legs travel to the lungs, this is life threatening)

Note: These side effects will be the same for oestrogenic medications

Progesterone (P4)

Progesterone (Greek for “pregnancy-supporting hormone”) is produced by the adrenal glands, ovaries and testes, and is abundant in XX females where it induces feminine secondary sexual characteristics and is involved in ovulation, menstruation and pregnancy for people with ovaries and uteruses. Oral (swallowed) progesterone is quickly eliminated by the liver, however, for people taking progesterone gels, implants, injections and/or suppositories (i.e. non-oral progesterone), progesterone may remain more abundant in the blood for longer because it can enter the bloodstream and circulate around the body before it gets eliminated by the liver.

Terminology

Progesterone (P4) refers to a single hormone from a group of hormones called “Progestogens” (Greek for “things that act like progesterone”), pharmacists have also made artificial (or “synthetic”) progestogens called “Progestins”, these terms should not be used interchangeably.

Progestogenic Effects in Trans People

Transmasculine	Transfeminine	During Puberty
Topical creams or gels can be used to help stop menstruation in conjunction with testosterone medications	Causes infertility Contributes to breast growth Can theoretically stunt breast-growth if taken too early (earlier than ~6 to 12 months on GAHT)	Progesterone is not a major part of a feminising puberty until 1-2 years after oestrogen levels begin to rise In people with ovaries and a uterus, this coincides with menarche (i.e. the beginning of menstruation)

Progestogenic Side Effects

Common	Uncommon	Rare
Breast tenderness, headaches, mood swings and depression	Acne, migraines, oedema (i.e. fluid retention under the skin), abdominal pain, back pain	Re-masculinisation when excess Progesterone is converted to Testosterone and DHT

Note: These side effects will be the same for progestogenic medications

Negative Feedback

In endocrinology “feedback” is how hormones regulate themselves in the body. For sex hormones, the body uses “negative feedback” where the brain senses high levels of any one sex hormone (oestrogens, progestogens or androgens) and then responds by telling the body to stop making all of the sex hormones.

This means that high levels of one sex hormone will reduce the levels of all other sex hormones produced by the body. It also means that gender affirming hormone therapy will suppress the body’s ability to produce sex hormones, and after 6 - 12 months at the right dosage, the hormones in those gender affirming medications will become the predominant hormones in the body.

Neurohormones

When high doses of hormone medications aren’t present, the brain controls sex hormones in the body with its own hormones, called “neurohormones”. The brain uses “gonadotropin releasing hormone” (GnRH) to stimulate the release of “gonadotropins” which are a group of hormones that includes follicle stimulating hormone (FSH) and luteinising hormone (LH), which tell the body to start producing sex hormones (androgens, oestrogens and progestogens).

When the body has produced enough sex hormones, the excess androgens, estrogens and/or progestogens will tell the brain to stop making GnRH, which stops the release of FSH and LH, which in turn stops the production of sex hormones, thereby completing the negative feedback loop. Doctors can therefore use levels of FSH and LH in the bloodstream to indicate whether gender affirming medications are properly suppressing the body’s sex hormones. If they’re working, the amount of FSH and LH in the bloodstream will be very low (<1). If FSH and LH are high (>1), greater doses of GAHT may be required.

Chapter 2

Gender Affirming Hormone Therapy

This chapter covers most of the medications available for gender affirming hormone therapy (and some that aren't so available), it provides the reader with guidelines about initiating treatment and the recommended starting and maximum doses of each medication.

This chapter should be used as a set of guidelines only, and not in the place of a medical professional who can assess individual needs, risks and complications, and tailor medical treatment around those factors.

For Those Who Wish to Masculinise

This section describes the treatment regimes and principles behind masculinising and de-feminising hormone therapy.

DISCLAIMER:
Please discuss all medications and regimes with a GP and/or endocrinologist before starting or changing medications and/or doses, and always read the consumer medicines information (CMI) leaflet before taking any medication.

To see the full range of medications available and tips and cautions about each, go to the “Hormone Medications” chapter.

Masculinising Hormone Therapy Regimes

Masculinising hormone therapy can be taken in combination with other medications to achieve the desired level of masculinisation, the following table describes the treatment principles physicians and community members use for hormonal masculinisation.

Goals	Medication Combination	Initiation Plan	Pros and Cons
Accelerated and Full Masculinisation	Testosterone Injections	Select an injectable testosterone and begin administering it at its standard dose until trough blood levels of total testosterone are reached at 10-15 nmol/L For Reandron, take the first two doses 6 weeks apart to achieve target testosterone levels more quickly, then continue at 10-14 week intervals	Provides the fastest and most complete masculinisation and best chances of stopping menstruation with testosterone alone
	Additional Medications	Anti-androgens like Finasteride can be used to prevent pattern hair-loss caused by testosterone Minoxidil can be used to stimulate hair growth on the body and face Oestrogen and progesterone can be used for vaginal dryness and ongoing menstruation	These medications help alleviate unwanted side-effects from testosterone and can assist in stopping periods, encouraging beard growth, and alleviating genital discomfort, however they may slightly hinder masculinisation
Gradual or Partial Masculinisation	Testosterone Gels and Patches	Testosterone is kept at a lower dose for longer, to start slow masculinisation. This can be changed later by increasing the dose if more accelerated or obvious masculinisation is desired Testosterone therapy can be stopped when desired masculinisation is achieved	This regime offers slower or more selective masculinisation, however, physical changes will still happen and having low levels of sex hormones for a long time can cause health complications like osteoporosis
De-Feminisation	Very Low Dose Testosterone	Testosterones can be kept at a very low dose and stopped when desired changes are achieved	Very low dose testosterone may reduce feminine characteristics but may also cause some unwanted masculinisation, like scalp hair-loss and acne

Masculinising Medication Doses

Testosterone Doses

Form	Medication	Standard Dose	Tips
Gels	Testavan	46 mg/d (2 pumps)	Apply to upper arms and thighs, leave uncovered to absorb for 5-10 mins, then cover to avoid inadvertent transferral to others
	Testogel	50 mg/d (1 sachet/4 pumps)	
	AndroForte	50 mg/d (1 ml)	
Patches	Androderm	5 mg/d (1 patch)	Apply to shoulder, abdomen or buttocks and cover to avoid inadvertent transferral to others, replace patch every day
Implants	Testopel	150 mg (2 pellets) per 3-6 mths	Can implant more pellets until desired levels are achieved
Injections	Reandron 1000	1000 mg (1 syringe) per 3 mths	Very long lasting, first 2 injections taken 6 weeks apart
	Sustanon 250	250 mg (1 syringe) per 2-4 wks	Shorter acting, mixture of testosterone esters
	Primoteston	250 mg (1 syringe) per 2-4 wks	Shorter acting, single testosterone ester

Other Affirming Medication Doses

Type	Form	Medication	Dose Range	Tips
Testosterone	Gels	AndroFeme	10 - 40 mg/d (1 - 4 ml/d)	Lower concentration gel used locally to improve body and facial hair growth
Oestrogen	Gels	Sandrena Estrofem	1 mg/d (1 sachet/pump)	For atrophy/dryness of feminised genitalia Start low and increase dose until effective
Progesterone	Gels	ProFeme	Variable	Apply internally or externally to help stop menstruation, start low and increase dose monthly until effective
		Crinone 8%	90 mg/d (1 applicator)	
Finasteride and Dutasteride	Pills	Finasteride	1 - 5 mg/d	Taken to prevent male-pattern hair-loss, finasteride must be taken every day forever and dutasteride can be taken every other day or every 3 days, forever
		Dutasteride	0.5 mg/d	
Minoxidil	Foam or Liquid	Regaine (Rogaine)	1 - 2 ml/d (1-2 droppers/caps)	Can be used to encourage body and facial hair growth
	Pills	Loniten	0.625 - 5 mg/d	

Examples of Masculinising Hormone Regimes

Example 1: GP Administered Testosterone Injections

This is the AusPATH standard for masculinising hormone therapy, it provides highly stable blood levels and reliable masculinisation.

Goal	Medications	Plan
Full and Accelerated Masculinisation	Testosterone Injections: 1000 mg per 3 months Reandron 1000 (First two doses 6 weeks apart)	Take the first two doses 6 weeks apart, then one dose every 3 months until trough blood levels of total testosterone are achieved at 10-15 nmol/L If adjusting the time between doses wait 2 injection cycles after the previous blood test, then take another blood test to confirm if adjustment is necessary
	Additional Medications: 2.5 mg/d Oral Minoxidil	Oral minoxidil causes body-wide hair growth and may stimulate facial hair growth, topical minoxidil can also be used for more targeted stimulation

Pros	Cons
Will only need treatment once every 3 months and once target testosterone levels are reached they are very stable, which reduces mood fluctuations	Reandron is slow to reach stable concentrations in the bloodstream so adjusting doses can take a long time, it cannot be self-administered, it causes significant injection site pain and is unsuitable for people with coagulopathies or thrombocytopaenia All testosterones including Reandron are controlled substances due to their use as performance enhancing drugs

Example 2: Self Administered Testosterone Injections

These medications are also approved by AusPATH but provide more autonomy with fewer doctors visits at the cost of less stable testosterone levels.

Goal	Medications	Plan
Full and Accelerated Masculinisation	Testosterone Injections: 250 mg per fortnight Primoteston	Start with 250 mg fortnightly injections until trough blood levels of total testosterone are achieved at 10-15 nmol/L, only adjust the dosing interval once trough blood levels are known
	Additional Medications: 0.5 mg/d Dutasteride	Taken to slow or prevent scalp hair loss caused by testosterone, can be substituted for finasteride as a cheaper but weaker alternative both medications may still hinder masculinisation, especially beard growth

Pros	Cons
Short acting testosterones like Primoteston and Sustanon 250 can be self-administered after instruction from a GP Starting Finasteride or Dutasteride may help avoid unwanted masculinising effects of testosterone especially for those with a family history of male-pattern baldness	Short acting testosterones (like Primoteston and Sustanon 250) are more likely to cause erythrocytosis, are associated with less stable testosterone levels and with fluctuations in mood and libido Finasteride and Dutasteride reduce DHT levels which may hinder facial and body hair growth

Example 3: Testosterone Patches and Progesterone Cream

This regime is great for gradual masculinisation with a self-managed form of testosterone therapy and additional medications to alleviate menstrual symptoms.

Goal	Medications	Plan
Gradual Masculinisation	Testosterone Patches: 5 mg/d Androderm	Start by applying 5 mg/d Androderm each day in the evenings, replacing the patch each day and keeping patches covered to avoid inadvertent transferral of testosterone to others, until trough blood levels of total testosterone are achieved at 10-15 nmol/L
	Additional Medications: 90 mg/d Crinone 8% (Progesterone Cream)	Crinone is a progesterone cream applied intravaginally at the same time each day to help stop menstruation and alleviate premenstrual symptoms if testosterone therapy alone is unable to

Pros	Cons
Patches are unobtrusive and easily covered after application If patches alone are unable to stop menstruation but higher levels of testosterone are not desired, progesterone creams may offer relief from symptoms with continued use	Patches may provide unstable levels, lose adherence and still inadvertently expose others to testosterone if not well covered, which can be dangerous to children and pets Progesterone creams may cause breast enlargement, hinder masculine fat redistribution and initiate menstruation and premenstrual symptoms before they are able to stop them with continued use

Example 4: Testosterone Gels and Creams

This regime is for de-feminisation using very low dose testosterone and finasteride to avoid scalp hair-loss, it also advocates for stopping testosterone therapy when desired de-feminisation is achieved.

Goal	Medications	Plan
De-feminisation	Testosterone Gels: 10 mg/d AndroFeme	Apply 10 mg/d AndroFeme to the upper arms and thighs, leave uncovered to absorb for 5-10 mins, then cover to avoid inadvertent transferral to others Stop treatment when masculinisation is achieved
	Additional Medications: 1 mg/d Finasteride	Taken to slow or prevent scalp hair loss caused by testosterone, can be substituted for dutasteride as a stronger alternative but both medications may hinder beard and body hair growth

Pros	Cons
AndroFeme is a low concentration testosterone cream that may provide very subtle masculinisation Testosterone therapy can be stopped when desired masculinisation is achieved Finasteride is a cheap and accessible medication that prevents scalp hair loss from testosterone	All gels and creams carry a risk of inadvertent transfer of testosterone to others and to pets, which can be dangerous, make sure the site of application is completely covered by clothing Gels and creams result in inconsistent blood levels and may struggle to achieve target testosterone levels in some people

For Those Who Wish to Feminise

This section describes the treatment regimes and principles behind feminising and de-masculinising hormone therapy.

DISCLAIMER:
Please discuss all medications and regimes with a GP and/or endocrinologist before starting or changing medications and/or doses, and always read the consumer medicines information (CMI) leaflet before taking any medication.

To see the full range of medications available and tips and cautions about each, go to the "Hormone Medications" chapter.

Feminising Hormone Therapy Regimes

Feminising medications can be taken in different amounts and combinations to achieve different levels of feminisation, the following table provides the different treatment principles physicians and community members use for hormonal feminisation.

Goals	Medication Combination	Initiation Plan	Pros and Cons
Accelerated and Full Feminisation	Oestrogen Therapy +Anti-androgens	Take the starting dose of an appropriate oestrogen and increase the dose every 3 months until trough blood oestrogen levels are between 300 and 800 pmol/L Take the starting dose of an appropriate anti-androgen and continue until testosterone is suppressed at <10 pmol/L free testosterone and and <2 nmol/L serum testosterone (not applicable for bicalutamide), only increase dose after 6 months Do not exceed maximum doses	This adequately suppresses testosterone and maintains oestrogen levels within a safe range but the type of anti-androgen is important: Cyproterone Acetate is very effective but may impair breast growth if taken early in transition because it is a progestin Spironolactone inadequately suppresses testosterone in most and should be weaned to avoid side effects Bicalutamide may improve breast growth but testosterone levels will remain high GnRH Analogues are the most effective choice but are expensive and may require a short course of Cyproterone Acetate to prevent an initial surge in testosterone
	Oestrogen Monotherapy	Take the starting dose of an appropriate oestrogen and increase the dose every 3 months until testosterone suppression is achieved at <10 pmol/L free testosterone and <2 nmol/L serum testosterone Do not exceed maximum dose	Some report better breast development and fat distribution Fewer medications to remember Higher oestrogen levels (~1500 pmol/L) may be required for complete testosterone suppression, which often requires oestrogen injections and may increase the risk of life threatening blood clots
	Adding Progestogens	Progestogens can be added to any feminising hormone regime after 6 - 12 months Take the starting dose of an appropriate progestogen and increase the dose until changes begin, do not exceed maximum dose If taking bio-identical progesterone, increase the dose until blood levels reach between 12 and 24 ng/ml	Some report improved breast development and many progestogens can reduce testosterone levels However, high doses of bioidentical progesterone can be converted into testosterone and DHT so do not exceed maximum doses To minimise this effect, take a lower dose, or add Dutasteride or Bicalutamide

Goals	Medication Combination	Initiation Plan	Pros and Cons
Gradual or Partial Feminisation	Low Dose Oestrogen Therapy ± Anti-androgen ± Progestogens ± Selective Estrogen Receptor Modulators (SERMs)	Stay on the starting dose of an appropriate oestrogen for a longer period, and increase the dose every 6 - 12 months as desired Anti-androgens can be added at low or regular doses for demasculinisation If desired, the starting dose of any progestogen can be added after 6 - 12 months to improve breast development If desired, the starting dose of any SERM can be added with oestrogen to prevent breast development	This regime offers slower or more selective feminisation However, physical changes will still happen, and having low levels of sex hormones for a long time can cause health complications like osteoporosis Eventually the oestrogen dose must increase until trough blood levels are in the 300 - 800 pmol/L range
De-Masculinisation	Very Low Dose Oestrogen Monotherapy	Take half of the starting dose of an appropriate oestrogen and increase the dose every 6 - 12 months if desired	Taking very low doses of oestrogen alone may confer some feminine changes to skin and hair but likely will not change testosterone levels significantly
	Anti-androgen Monotherapy	Take the starting dose of an appropriate anti-androgen and increase the dose until demasculinisation is achieved or highest dose is reached Do not exceed the highest dose	Taking an antiandrogen alone may reduce masculine characteristics, but can cause long term health complications without simultaneous oestrogen therapy Very high doses of some anti-androgens may be required for demasculinisation
	Selective Estrogen Receptor Modulators (SERMs)	Take the starting dose of an appropriate SERM to prevent breast growth caused by oestrogens Do not exceed the highest dose	SERMs may not be readily available given that they are anti-cancer drugs These are also untested for gender affirming hormone therapy Some report feminisation without breast development

Feminising Medication Doses

Oestrogen Doses

Form	Starting Dose	Highest Dose	Tips
Pills	2 mg/d (1 pill)	8 mg/d (4 pills)	Increase by 2 mg every 3 months up to 8 mg/d High dose oral oestrogen damages the liver long term
Patches	50 mcg E4D	300 mcg E3D	Get oestrogen levels tested and add extra or higher dose patches until desired levels are reached, many people will not be able to achieve satisfactory oestrogen levels with patches alone
Gels	1 mg/d (1 sachet/pump)	4 mg/d (4 sachets/pumps)	Increase by 1 mg/d every 3 months up to 4 mg/d Satisfactory oestrogen levels might be unachievable with gels
Implants	50 mg (1x 50 mg pellet) every 12 months	200 mg (2x 100mg pellets) every 6 months	More pellets can be implanted more frequently (usually between 6 and 12 months apart) until oestrogen levels are satisfactory Pellets are not removed or replaced, they are left in place to dissolve when the new pellet is inserted
Injections	See the “Hormone Medications” chapter for more information about each injectable oestrogen		Doses and time between doses change with different types of injectable oestrogen

Anti-androgen Doses

Form	Starting Dose	Highest Dose	Tips
Spironolactone	50 mg/d	200 mg/d	Increase by 50 mg/mth until testosterone is suppressed, if discontinuing, wean off at 25 mg per week
Cyproterone Acetate	10 to 12.5 mg/d	25 mg/d	Double dose every 6 months up to 25 mg/d or until testosterone is suppressed Low doses can be taken EOD if testosterone is well suppressed, can also take 25mg every 3-7 days if testosterone is well suppressed No need to wean off if discontinuing
Bicalutamide	12.5 mg/d	150 mg/d	Double dose every 6-12 months up to 50 mg/d or until effective, normal gender affirming doses are from 25 to 50 mg/d Takes 4-12 weeks to accumulate in the body The highest dose is used in AMAB gender diverse people who aren’t taking oestrogen, and is associated with high risk of liver and lung damage
GnRH Analogues	See the “Anti-Androgens” chapter for more information about GnRH analogues		The testosterone flare caused by GnRH analogues can be suppressed with 25mg/d of Cyproterone Acetate for 2-4 weeks

Progestogen Doses

Form	Starting Dose	Highest Dose	Tips
Bioidentical Pills	100 mg/day	300 mg/day	These can be taken rectally High doses may increase levels of testosterone and DHT
Bioidentical Gels	~90 mg/day (1 sachet or 1 ml)	~270 mg/day (3 sachets or 3 ml)	Applied to upper arms and thighs This type of progesterone may reduce potential androgenic effects
Progestin Implants	68 mg (1 implant) every 3 years		This dose is rarely exceeded Progestin implants are removed and replaced each time
Injections	See the “Hormone Medications” chapter for more information about each injectable progestogen		Doses depend heavily on whether the injection is bioidentical progesterone or a progestin

Other Affirming Medication Doses

Type	Medication	Starting Dose	Highest Dose	Tips
Finasteride and Dutasteride	Finasteride	1 mg/d	5 mg/d	Taken with GAHT for further testosterone blocking effects Needs to be taken the same time every day
	Dutasteride	0.5 mg/d		forever, dutasteride can be taken every day, every other day, or every 3 days forever
SERMs	Raloxifene	60 mg/d		This is the standard dose used for menopausal symptoms and osteoporosis
	Tamoxifen	20 mg/d	40 mg/d	Take at the same time each day For those with liver problems, only small doses are required (10mg) High doses are uncommon and are usually only taken with ongoing medical consultation and supervision
	Clomiphene	50 mg/d		Long term therapy with Clomiphene is not recommended

Examples of Feminising Hormone Regimes

Example 1: Oral Oestrogens and Spironolactone

This is AusPATH standard practice for feminising hormone therapy, cheap and easy to access. Many transfeminine people will start out on these medications.

Goal	Medications	Plan
Full and Accelerated Feminisation	Oral Oestrogen: 2 mg/d Progynova Anti-Androgen: 50 mg/d Spironolactone	Increase dose by 2 mg every 3 months until trough blood oestrogen levels are between 300 and 800 pmol/L Do not exceed 8 mg/d of Progynova Increase the dose by 50mg every 3 months until testosterone is suppressed at <10 pmol/L Free T and <2 nmol/L Serum T Do not exceed 200 mg/d of Spironolactone

Pros	Cons
These medications are internationally approved by WPATH and have excellent safety profiles They're also very cheap and accessible	Spironolactone is a weak anti-androgen and may not adequately suppress testosterone even at its maximum dose Oral oestrogen may not achieve target blood oestrogen levels, however taking half a dose twice daily sublingually or rectally may achieve higher blood levels of estrogen at the same dose Long term use may have adverse effects on liver health

Example 2: Oestrogen Patches and Cyproterone Acetate

This is a variation on AusPATH approved standard practice which may achieve a greater E2 to E1 ratio and faster testosterone suppression.

Goal	Medications	Plan
Full and Accelerated Feminisation	Oestrogen Patches: 50 mcg E4D Estradot	Increase dose by 50 mcg every 3 months until trough blood oestrogen levels are between 300 and 800 pmol/L Do not exceed 300 mcg E3D
	Anti-androgen: 12.5 mg/d Cyproterone Acetate	When testosterone is suppressed at <10 pmol/L Free T and <2 nmol/L Serum T, decrease the dose to 12.5mg EOD, then 12.5mg E4D, then 25 mg/wk if T still suppressed Do not exceed 25 mg/d of Cyproterone Acetate

Pros	Cons
Patches are unobtrusive, can be applied every 3-4 days, produce greater ratios of E2 to E1 in the bloodstream compared to pills and GPs are much happier to prescribe patches compared to injections Cyproterone acetate is a powerful anti-androgen, and 12.5 mg/d should totally suppress testosterone by 6 months, thereafter very low and infrequent doses are required to sustain suppression, making Cyproterone Acetate a very affordable anti-androgen over time	Patches are relatively expensive, may lose adhesion and leave sticky residue on the skin, and may not achieve adequate oestrogen levels at their highest dose Cyproterone is a progestin which might stunt breast growth if given early in transition Cyproterone acetate may cause meningiomas and have adverse effects on liver function with long term use

Example 3: Injectable Oestrogens and Bicalutamide

This is not standard practice and neither of these medications are promoted by AusPATH, however, the transfeminine community leans toward this style of treatment for its purported advantages in breast growth and fat redistribution despite both medications being more expensive and harder to access than others.

Goal	Medications	Plan
Full and Accelerated Feminisation	Injectable Oestrogen: 1mg/wk Estradiol Enanthate	Increase dose by 1 mg every 3 months until trough blood oestrogen levels are between 300 and 800 pmol/L Do not exceed 5 mg E5D of Estradiol Enanthate
	Anti-Androgen: 25mg/d Bicalutamide	Increase dose to 50 mg/d after 6 months if more accelerated feminisation is desired Do not exceed 50 mg/d of Bicalutamide while taking oestrogen

Pros	Cons
Injectable oestrogens easily achieve target blood oestrogen levels and produce much greater E2 to E1 ratios compared to pills Bicalutamide is a highly selective anti-androgen which may promote breast growth early in transition	Many GPs aren't comfortable with this regime Whether purchased online or through compounding pharmacies, injectable oestrogens are notoriously inconsistent in quality and may produce unstable blood levels with high peaks and low troughs Bicalutamide is expensive and hard to access, and liver function blood tests are required initially for monitoring

Example 4: Oestrogen, SERMs and Finasteride

This is an experimental and unproven regime used for partial feminisation, assessment by an endocrinologist is essential before taking these medications.

Goal	Medications	Plan
Partial Feminisation	Oestrogen+SERM: 50mcg E4D Oestrogen Patches 60mg/d Raloxifene	This causes feminisation without breast development, if more changes are desired, increase estrogen patch dose by 50 mcg every 6 months but do not exceed 300 mcg E3D Do not ever exceed 60 mg/d Raloxifene
	Anti-androgen: 1 mg/d Finasteride	Finasteride reduces blood levels of DHT by 70%, reducing its masculinising effects, especially preserving scalp hair Dutasteride may be substituted if a greater reduction in DHT is desired for further de-masculinisation

Pros	Cons
In addition to the benefits of oestrogen patches that are outlined previously, using a non-oral oestrogen in tandem with Raloxifene may protect against adverse effects on the liver and reduce the risk of DVT	Many GPs will shudder at the mention of this regime and refer patients to an endocrinologist due to its experimental nature Raloxifene is used in breast cancer, osteoporosis and menopause; it is not tested as a gender affirming medication and it carries a similar risk of DVT to bioidentical oestrogen, meaning these risks may compound when raloxifene is taken with oestrogen, especially in oral forms

Chapter 3

Self-injection Guidelines

This chapter describes the resources and steps to take when self-administering injectable medications. The information here must only be used to guide and remind the reader AFTER receiving supervised instruction from a GP or endocrinologist who is satisfied that safe and sterile technique will be adhered to, and that injury and infection risks are minimal. If the reader has no prior training in self-injection, please seek professional assistance first.

How to Inject Androgens

Short-acting testosterones that are suitable for self-injection like Primoteston and Sustanon 250, come as pre-filled syringes that are delivered intramuscularly (IM) every 2-4 weeks, so no additional syringes or needles are required for these forms of testosterone.

Supplies for Intramuscular (IM) Injections

Selecting the correct gauge (G) needle is important. Gauge refers to the diameter of the needle and a smaller gauge means a wider needle, so 22G is wider than a 25G needle.

Supplies	Details	Approx AUD (Quantity)
Alcohol Swabs	70% Isopropyl Alcohol swabs for disinfection	$10 (200)
Round Bandaids	For application over the injection site if bleeding occurs	$5 (100)
23G Needles and Syringes	**1ml Syringe with a 25mm x 23G Fixed Needle** (single use only)	$16 (1)
Sharps Container	The price range reflects the multiple sizes available, these are necessary for the safe disposal of needles and syringes	$5 - $50 (1)

Steps for Intramuscular (IM) Injections

1. **Preparation**: Swab top of the vial, then the outer thigh OR upper-outer buttock with the alcohol swab. When swabbing the injection site, spiral outward from the centre and do not swab back over swabbed areas.
2. **Drawing Up**: Uncap the needle, shake then invert the vial, then insert the needle into the vial through the membrane. Slowly pull back on the syringe's plunger to draw up the medication.
3. **Remove Bubbles**: Alternate between depressing and withdrawing the plunger while tilting the syringe to usher all bubbles back through the needle and into the vial.
4. **Measure Dose**: Ensure the stopper at the end of the plunger lines up with the appropriate measuring line on the syringe, then remove the needle from the vial.
5. **Z-Tracking**: Before injecting, press down on the skin then drag it away from the injection site. After injecting, release the skin to seal the medication within the tissue layer.
6. **Injecting**: Insert the entire needle into the skin at a 90° angle then ALWAYS PULL BACK ON THE PLUNGER. If blood is drawn back into the syringe DO NOT INJECT, take the needle out, bandage and restart from step 1 at a new injection site. However, if no blood is visible slowly push down on the plunger until the syringe is empty.
7. **Sharps Disposal**: Pull the needle out and place it directly into the sharps container. To avoid needle stick injuries DO NOT PUT THE NEEDLE CAP BACK ON.
8. **Bandaging**: Apply a bandaid over the injection site.

Troubleshooting: If medication leaks from the injection site, try depressing the plunger more slowly, leaving the needle in for ~30 seconds, and withdrawing the needle very slowly. This gives the medication more time to settle in the tissue. Additionally, pin-point bleeding is normal after some injections; it doesn't affect the medication dose, or indicate injection into a vein.

How to Inject Oestrogens and Progestogens

Injectable oestrogens and progestogens rarely come in pre-filled syringes, and can be delivered subcutaneously (SC) or intramuscularly (IM) on a weekly basis, therefore, proper drawing up and injecting procedure is necessary for self-administration.

Supplies for Subcutaneous (SC) Injections

Selecting the correct gauge (G) needle is important. Gauge refers to the diameter of the needle and a smaller gauge means a wider needle, so 25G is wider than a 29G needle.

Supplies	Details	Approx AUD (Quantity)
Alcohol Swabs	70% Isopropyl Alcohol swabs for disinfection	$10 (200)
Round Bandaids	For application over the injection site if bleeding occurs	$5 (100)
27G Needles and Syringes	**0.5ml Syringe with a 13mm x 27G Fixed Needle** (single use only)	$30 (100)
Sharps Container	The price range reflects the multiple sizes available, these are necessary for the safe disposal of needles and syringes	$5 - $50 (1)

Steps for Subcutaneous (SC) Injections

1. **Preparation**: Swab top of the vial, then the lower abdomen OR outer thigh with the alcohol swab. When swabbing the injection site, spiral outward from the centre and do not swab back over swabbed areas.
2. **Drawing Up**: Uncap the needle, shake then invert the vial, then insert the needle into the vial through the membrane. Slowly pull back on the syringe's plunger to draw up the medication.
3. **Remove Bubbles**: Alternate between depressing and withdrawing the plunger while tilting the syringe to usher all bubbles back through the needle and into the vial.
4. **Measure Dose**: Ensure the stopper at the end of the plunger lines up with the appropriate measuring line on the syringe, then remove the needle from the vial.
5. **Skin Pinching**: Before injecting, pinch the injection site between two fingers to ensure that only the subcutaneous layer is injected into. After injecting, release the skin.
6. **Injecting**: Insert the entire needle into the skin at a 45° angle then slowly push down on the plunger until the syringe is empty.
7. **Sharps Disposal**: Pull the needle out and place it directly into the sharps container. To avoid needle stick injuries DO NOT PUT THE NEEDLE CAP BACK ON.
8. **Bandaging**: Apply a bandaid over the injection site.

Troubleshooting: If medication leaks from the injection site, try depressing the plunger more slowly, leaving the needle in for ~30 seconds, and withdrawing the needle very slowly. This gives the medication more time to settle in the tissue. Additionally, pin-point bleeding is normal after some injections; it doesn't affect the medication dose, or indicate injection into a vein.

Chapter 4

Hormone Medications

Gender affirming hormone therapy encompasses many medications, each with different prices, potencies and delivery systems. This chapter lists many of the available forms of gender affirming hormone therapy, provides information about their different doses, approximate prices and tips and cautions for use. When considering new hormone regimes or delivery methods, here is a great place to start.

Androgenic Medications

Testosterone Topical Gels

Brand Name(s)	Generic Name	Dose(s)	PBS Listed?	Approx Cost	Tips	Cautions
AndroForte	5% Testosterone cream	50 mg/ml	Yes	Non-Concession: $42.50 Concession: $5.80	Apply gels to forearms and/or thighs, alternating sides with each dose, pump or sachet Testogel is available in sachets or as a dose-metered pump dispenser	Try not to cover freshly applied gels with clothes for 5-10 minutes but keep the area covered thereafter to avoid inadvertent transferral of testosterone to others Avoid swimming or bathing for 6 hours If a rash or skin irritation develops discontinue immediately and see a doctor
AndroFeme	1% Testosterone cream	10 mg/ml	No	Private script: $89.40		
Testogel	1% Testosterone gel	50 mg/sachet 12.5 mg/pump	Yes	Non-Concession: $42.50 Concession: $5.80		
Testavan	2% Testosterone gel	23 mg/pump	Yes	Non-Concession: $42.50 Concession: $5.80		

Testosterone Patches

Brand Name(s)	Generic Name	Dose(s)	PBS Listed?	Approx Cost	Tips	Cautions
Androderm	Testosterone transdermal delivery system	2.5 - 5 mg/d	Yes	Non-Concession: $42.50 Concession: $5.80	These are once-per day patches so 2.5 or 5 mg is delivered per day then the patch is replaced with a new one each evening, do not overlap patches	Wash hands with soap and water after applying, and cover the area with clothing to avoid inadvertent transferral of testosterone to others Loss of adhesion is a common issue, the product “Tegaderm” can be used to hold patches in place, these can be found at most pharmacies or online

Testosterone Implants

Brand Name(s)	Generic Name	Dose(s)	PBS Listed?	Approx Cost	Tips	Cautions
Testopel Otherwise use compounding pharmacy	Testosterone pellet	75mg every 3-6 months	No	?	These must be ordered from a compounding pharmacy like Stenlake (NSW) or Complementary Compounding Services (NSW) These require a doctor for implantation and some will charge for this service	There is a very small risk of implant rejection If it gets sore or inflamed, see a doctor, it may need to be removed and a different kind of testosterone should be considered

Injectable Testosterone

Brand Name(s)	Generic Name and Dose	Injection Cycle	PBS Listed?	Approx Cost	Tips	Cautions
Reandron 1000	Testosterone undecanoate 1000 mg/ml	Every 10-14 weeks	No	Authority script: $42.50 Private script: $116.45 Concession: $6.80	Warming the testosterone vial to body temperature can make the liquid runnier, and make injection easier Testosterone injections are usually administered by a GP or nurse at the GP clinic	Reandron injections can be painful, and result in soreness for a few days afterwards Short acting testosterone (especially Sustanon and Primoteston) can cause polycythaemia (overproduction of blood cells), which should be monitored by a GP and is usually treated by regular blood donation
Sustanon 250	Combination of: Testosterone propionate Testosterone phenylpropionate Testosterone isocaproate Testosterone decanoate Total Testosterone = 250 mg/ml	Every 2-4 weeks	No	Non- Concession: $42.50		
Primoteston	Testosterone enanthate 250 mg/ml	Every 2-4 weeks	No	Non- Concession: $42.50		

Oestrogenic Medications

Oral Oestrogens

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost	Tips	Cautions
Progynova	Estradiol valerate	Sugar-coated Dissolves better sublingually	Yes	Non-concession: $24.42 Concession: $6.80	Pills can be dissolved under the tongue (a.k.a taken “sublingually”) to bypass the liver, and increase the amount of oestrogen in the body Pills can also be inserted rectally to bypass the liver and increase the amount of oestrogen in the body	Taking oral oestrogen sublingually or rectally causes spikes in oestrogen levels, so smaller, more frequent doses might be required for consistent oestrogen levels Some pills dissolve better than others (and some people’s mouths are better at dissolving pills sublingually than others), so many people choose to take oestrogen orally
Zumenon	Estradiol hemihydrate	More difficult to dissolve sublingually	Yes	Non-concession: $24.12 Concession: $6.80		
Estrofem	Estradiol hemihydrate	Comes in a rotating dispenser	No	Private Prescription: $29.39		

WARNING FOR THOSE WHO SMOKE OR VAPE:
Nicotine inhibits an enzyme called aromatase, which prevents the liver from processing oestrogen pills
If unable to quit smoking/vaping use oestrogen gels, patches, implants or injections, because these don’t rely on the liver

Oestrogen Topical Gels

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost	Tips	Cautions
Sandrena	Estradiol hemihydrate gel	Comes packaged as several 1 mg/g sachets	Yes	Non-Concession: $27.20	Apply gels to the forearms and/or thighs, alternating sides with each dose/pump/sachet	Try not to cover freshly applied gels with clothes until the gel has had time to absorb into the skin (5-10 minutes), otherwise it may not absorb fully If a rash or skin irritation develops discontinue immediately and see a doctor
Estrogel	Estradiol hemihydrate gel	Metered-dose pump dispenser delivers ~0.75 mg/pump	No	Private Prescription: $27.99		

Oestrogen Patches

Brand Name(s)	Generic Name	Doses and Patch Size	PBS Listed?	Approx Cost	Tips	Cautions
Estraderm MX	Estradiol hemihydrate transdermal system	25 mcg = 3.3 x 3.3 cm 50 mcg = 4.7 x 4.7 cm 75 mcg = 5.7 x 5.7 cm 100 mcg = 6.6 x 6.6 cm **Largest** patches	Yes	Non-Concession: $27.20 - $28.97 Concession: $6.80	Scrotal or neo-labial skin can absorb patches much faster than other areas, resulting in higher levels of oestrogen The number on the packet (e.g. 25, 50, 75 or 100) is the amount of oestrogen delivered by each patch per day, not the total amount of oestrogen in the patch	Loss of adhesion is a common issue with patches, use a "Tegaderm" to hold it in place, these can be found at most pharmacies or online
Climara	Estradiol hemihydrate transdermal system	25 mcg = 2.5 x 2.5 cm 50 mcg = 3.5 x 3.5 cm 75 mcg = 4.3 x 4.3 cm 100 mcg = 5 x 5 cm **Smaller** patches Same price as Estraderm	Yes	Non-Concession: $27.20 - $28.97 Concession: $6.80		
Estradot	Estradiol hemihydrate transdermal system	25 mcg = 1.6 x 1.6 cm 37.5 mcg = 1.9 x 1.9 cm 50 mcg = 2.2 x 2.2 cm 75 mcg = 2.7 x 2.7 cm 100 mcg = 3.2 x 3.2 cm **Smallest** patches More expensive	Yes	Non-Concession: $32.65 - $33.39 Concession: $6.80		

Oestrogen Implants

Brand Name(s)	Unique Properties	Approx Cost	Tips	Cautions
No brand name or generics available Must be ordered from compounding pharmacy	Comes in 50mg and 100 mg pellets Can be implanted by the GP or endocrinologist, some will charge for the procedure, others will bulk bill	Private Prescription: $95 - $141 per pellet	These must be ordered from a compounding pharmacy like Stenlake (NSW) or Complementary Compounding Services (NSW) These require a doctor to implant them, and some doctors will charge an extra fee for this service	Implants may be less effective in people who don't already have stable oestrogen levels, this is called "tachyphylaxis" There is a small risk of implant rejection If it gets sore or inflamed, see a doctor, it may need to be removed and a different oestrogen considered

Injectable Oestrogens

Generic Name	Unique Properties	Dose Range	Approx Cost	Tips	Cautions
Estradiol benzoate (EB)	Very Fast Absorbing, Very High Peaking, Very Short Lasting Will need to inject very small doses very frequently for stable levels	0.5 mg - 1.5 mg every 2-3 days	Compounding: ? Online: ?	Injectable oestrogens are best stored at room temperature and away from direct sunlight, if they're refrigerated, the oils in them can solidify Shake well before injecting, to make sure that the oestrogen is mixed evenly in the vial Adjust your dose until your blood estradiol is between 300 pmol/L and 800 pmol/L	Please make sure to follow the injection guide every time and never share or reuse needles These must be ordered from a compounding pharmacy like Stenlake (NSW) or Complementary Compounding Services (NSW) Many doctors warn against injectable oestrogens due to poor quality control which may lead to inconsistent and unstable oestrogen levels
Estradiol valerate (EV)	Fast Absorbing, High Peaking, Short Lasting Will need to inject smaller doses more frequently for stable levels	1 mg - 3 mg every 5-7 days	Compounding: ? Online: $56 - $92		
Estradiol cypionate (EC)	Slow Absorbing, Low Peaking, Long Lasting Can inject larger doses less frequently and still have stable levels	1 mg - 5 mg every 5-7 days	Compounding: ? Online: $120		
Estradiol enanthate (EEn)	Slow Absorbing, Low Peaking, Long Lasting Can inject larger doses less frequently and still have stable levels	1 mg - 5 mg every 5-7 days	Compounding: ? Online: $90 - $113		
Estradiol undecyclate (EU)	Very Slow Absorbing, Very Low Peaking, Very Long Lasting Takes a long time to reach a stable level (~3-4 months) but can inject large does very infrequently	2 mg - 10 mg every 10-14 days	Compounding: ? Online: ?		

Progestogenic Medications

Oral and Rectal Progesterone

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost	Tips	Cautions
Prometrium	Micronised progesterone	Comes in 100 mg and 200 mg soft capsules	No	Private Prescription: $36.69	Rectal administration of Prometrium results in better progesterone levels. For some people, piercing the soft capsule with a needle assists with absorption	It is unlikely that doctors will prescribe Endometrin or Utrogestan, which are designed for cis-vaginal use Neovaginas are not suitable for medication absorption
Endometrin	Micronised progesterone	Comes in 100 mg suppositories designed for cis-vaginal absorption	Yes	Non-Concession: $42.50 Concession: $6.80		
Utrogestan	Micronised progesterone	Comes in 200 mg suppositories designed for cis-vaginal absorption	Yes	Non-Concession: $42.50 Concession: $6.80		
Crinone 8%	Progesterone gel	90 mg single-dose disposable applicator for cis-vaginal absorption	Yes	Non-Concession: $42.50 Private Prescription: $135.39		

Progesterone Topical Gels

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost	Tips	Cautions
ProFeme-10 ProFeme-3.2	Progesterone cream	Comes in 10% and 3.2% Variable doses can be applied by removing the cream from its tube with the syringe applicator to measure the dose	No	Private Prescription: $90	Apply to forearms/ thighs, alternate sides with each dose, Profeme-10 can be ordered online with a prescription at Lawley Pharmaceuticals (WA)	Do not cover gels with clothes until absorbed Crinone is rarely prescribed to trans people because neovaginas are not suitable for absorption If a rash or skin irritation develops, discontinue immediately and see a doctor

Progestin Implants

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost	Tips	Cautions
Implanon NXT	Etonogestrel	Comes with applicator needle Replaced every 3 years, requires a small surgery	Yes	Non- concession: $42.50 Private Prescription: $171.39	Etonogestrel is a long lasting progestin which should be inserted and replaced by a GP, who may charge for the procedure	This is rarely prescribed to trans people Etonogestrel is an androgenic progestin that may cause re-masculinisation for some There is a small risk of implant rejection If it gets sore or inflamed, see a doctor, it may need to be removed

Injectable Progestogens

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost	Tips	Cautions
Proluton Makena Progeston	Hydroxy-progesterone caproate 250 mg/ml	A progestin with no androgenic effects and lasts ~7 days	No	Online: $16.90 - $54+	Injectable bioidentical progesterone has a very short half-life, so requires injections every 2-3 days Progestins like Lena's OHPC and Otokonoko's MPA, may only require injections once a week and once a month, respectively Injectable progesterone is best stored at room temperature and away from direct sunlight Shake well before injecting	When injecting, proper procedure is very important, make sure to follow the injection guide every time, and never share or reuse needles Most of these progesterone injections are produced by individuals in the trans community, not by pharmacies, therefore they are unregulated and may be inconsistent
Lena's Combined EV and P	Estradiol valerate and progesterone	Can customise the EV to P ratio on Lena's website	No	Online: ~$30		
Lena's EV and OHPC	Estradiol valerate and hydroxy-progesterone caproate	Can customise the EV to OHPC ratio on Lena's website	No	Online: ?		
Otokonoko Progesterone	Progesterone 50 mg/ml	Bioidentical injectable progesterone that lasts ~24hrs	No	Online: ~$15		
Otokonoko Medroxy-progesterone acetate	Medroxy-progesterone acetate 0.05 mg/ml	A progestin ~3x stronger than bioidentical progesterone but may act like testosterone in some parts of the body	No	Online: ~$120		

Chapter 5

Anti-Androgens

Anti-androgens (also called androgen blockers, or testosterone blockers) are medications that either reduce the amount of androgens in the body and/or stop them interacting with the body. The most prescribed anti-androgenic medications are Spironolactone, Cyproterone Acetate and Bicalutamide, which are all discussed below, as well as Finasteride and Dutasteride, which are sometimes used together with other anti-androgens.

Note: High levels of oestrogen and progesterone also reduce androgens through negative feedback so they can be thought of as “natural” anti-androgens.

Spironolactone

Spironolactone (spy-row-no-LACK-tone) is sometimes shortened to “spiro”. It blocks testosterone and DHT from acting on the body but doesn’t have much effect on testosterone production. It also increases urination frequency.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Aldactone Spiractin Spironolactone Viatris	Spironolactone	25 mg and 100 mg tablets that smell minty but taste like chemicals and sadness	Yes	Non- Concession: $24.99 Concession: $6.80

How Spironolactone Works

Spironolactone is a similar shape to several hormones, including androgens. This allows it to occupy and weakly block androgen receptors. Spironolactone is also a similar shape to aldosterone, and when it blocks aldosterone’s receptor it increases urine output, which can cause mild dehydration.

Note: Bicalutamide is a much stronger and more selective androgen receptor blocker.

Spironolactone Pros, Cons and Side Effects

Pros	Cons
Cheap and available	Weak testosterone blocker, more noticeable side-effects than other medications and tastes quite bad

Side Effects

Common	Serious but Rare at Low Doses (<100mg)
More frequent urination, dehydration, muscle cramps, salt cravings, initial scalp hair shedding (temporary), reduced body hair and reduced libido	Hyperkalaemia (too much potassium in the blood) which can cause arrhythmias (abnormal heart rhythms)

Spironolactone Tips and Cautions

Tips	Cautions
Take with water, they really do taste bad Take at the same time every day and split doses: Spironolactone doesn’t spend much time in the body (~6 hours), so taking half in the morning and half at night will reduce side effects and block androgens more consistently	Test potassium levels regularly and avoid high potassium foods Spiro can cause a build up of potassium which causes serious heart problems if left unchecked

Cyproterone Acetate

Cyproterone Acetate (SAI-pro-ter-own A-se-tate) is sometimes shortened to “CPA”. CPA stops the production of testosterone and DHT through negative feedback but doesn’t block androgen receptors at doses lower than 50 mg/d.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Androcur Anterone Cyproterone Cyprone Cyrotone Cyprostat	Cyproterone Acetate	Strong progestin, may stunt breast growth if taken too early	No	Private: $21.99

How Cyproterone Acetate Works

Cyproterone Acetate is a very strong progestin (~1000x stronger than natural progesterone) that suppresses androgen production via overwhelming negative feedback. At doses greater than 50 mg/d, Cyproterone Acetate also begins to act as an androgen receptor blocker.

Cyproterone Acetate Pros, Cons and Side Effects

Pros	Cons
Few noticeable side effects, may only need to be taken every other day, more effective than Spironolactone and Bicalutamide at reducing testosterone	Can theoretically stunt breast growth if taken early in transition because it’s a progestin

Side Effects

Common	Uncommon	Serious but Rare at Low Doses (<25mg)
Reduced motivation, lethargy, mood changes and reduced libido	Initial scalp hair shedding (temporary, not permanent) and reduced body hair	Meningioma /prolactinoma (brain tumours)

Cyproterone Acetate Tips and Cautions

Tips	Cautions
Pills are small and can be difficult to cut, get a good pill cutter Stays in the bloodstream for up to 7 days so doses can be taken less frequently than other anti androgens once testosterone is suppressed	Acts like progesterone in the body and therefore may stunt breast growth if taken too early Often associated with mood changes and depression Can contribute to changes in appetite, increased or decreased

Bicalutamide

Bicalutamide (bick-A-loo-TA-mide) is sometimes shortened to “Bica”. It blocks the action of testosterone and DHT in the body but does not block their production.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Bicalutamide Bicalox Bicalide Calutex Casodex Cosudex Cosamide	Bicalutamide	Is a much more potent and selective androgen receptor blocker than spironolactone with far fewer side effects	No	Private Prescription: $53.69

How Bicalutamide Works

Bicalutamide is a very strong androgen receptor blocker that prevents androgens from acting on the body’s cells. It doesn’t stop androgen production though, instead it actually imitates a lack of androgen feedback, which causes the brain to increase the body’s androgen production but the body never makes enough androgen to outcompete bicalutamide.

Bicalutamide Pros, Cons and Side Effects

Pros	Cons
Very few side effects, and stays in the body a long time (it’s okay to miss a dose occasionally)	Expensive and can take 4 to 12 weeks to fully accumulate and reach full effect and it may not reduce erections or ejaculation

Side Effects

Common	Uncommon	Serious but Rare at Low Doses (<150mg)
Breast tenderness, hot flashes and mood changes	Temporary changes to liver enzymes that doesn’t usually cause issues	Liver injury and lung injury (very unlikely if previously healthy)

Bicalutamide Tips and Cautions

Tips	Cautions
Bicalutamide takes 4-12 weeks to fully build up in the body (but in 4 weeks about ~90% has accumulated, and the last 10% takes a further 8 weeks) If switching to bicalutamide, it’s advisable to wait at least 4 weeks before beginning to wean off other anti-androgen(s)	Bicalutamide requires blood tests to monitor liver function when first starting It has been reported to cause temporary scalp hair shedding For people with testes, or who aren’t taking other anti-androgens, bicalutamide increases the amount of testosterone in the body, don’t worry though, it is potent enough to block all of it

Finasteride and Dutasteride

Finasteride (fin-ASS-ter-ide) is sometimes shortened to “fin” or “fina” and Dutasteride (doo-TASS-ter-ide) is sometimes shortened to “dut” or “duta”. These both stop the conversion of some testosterone into DHT but they don't stop testosterone production.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Finasteride Finasta Finpro Finnacar Proscar Propecia	Finasteride	Comes in 1 mg or 5 mg tablets (that can be quartered) Reduces DHT by ~75%	Yes	Private Prescription: $29.90 Concession: $6.80
Dutasteride Avodart	Dutasteride	Comes in 0.5 mg doses Reduces DHT by ~95%	Yes	Private Prescription: $19.90 Concession: $6.80

How Finasteride and Dutasteride Work

Finasteride and Dutasteride block the enzyme 5a-reductase (5ar) whose job it is to convert testosterone into DHT. Finasteride inhibits one 5ar isoform, preventing ~75% of DHT synthesis. Dutasteride inhibits several isoforms of 5ar, preventing ~95% of DHT synthesis.

Finasteride and Dutasteride Pros, Cons and Side Effects

Pros	Cons
Finasteride is cheap and available, can be used with GAHT to slow or stop male pattern hair loss and dutasteride is stronger than finasteride	Dutasteride is expensive Requires ongoing use and may have some effect on mood and sexual function

Side Effects

Common	Uncommon	Rare
Reduced libido, initial scalp hair shedding (temporary), reduced body hair	Mood disturbances	Post-finasteride syndrome (persistent psychosexual dysfunction in cis men)

Finasteride and Dutasteride Tips and Cautions

Tips	Cautions
5 mg Finasteride tablets can be quartered to create a 1.25 mg dose, which works out cheaper If taking for hair-loss, keep taking them with or without another anti-androgen Dutasteride can be taken every other day, or every 3 days combined with daily finasteride	Dutasteride is only prescribed at concession rates for prostate cancer

GnRH Analogues

GnRH Analogues (GnRHa's) are synthetic forms of Gonadotropin (go-nad-o-trope-in) Releasing Hormone (GnRH), which is a neurohormone that controls sex hormones.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Zoladex	Goserelin acetate	Comes as a 10.8 mg implant Lasts 3 months	Yes	Private: $270.32 Concession: $42.50
Diphereline	Triptorelin embonate	Comes as a single 22.5 mg injection Lasts 6 months	Yes	Private: $1839.40 Concession: $42.50
Lucrin Depot 6-Month	Leuprorelin acetate	Comes as one 45 mg injection in a dual chamber syringe Lasts 6 months	Yes	Private: $1750.62 Concession: $42.50
Synarel	Nafarelin acetate	Comes as 60 pump nasal spray (200 mcg per pump) Taken morning and night	Yes	Private: $122.98 Concession: $42.50

How GnRHa's Work

GnRHa's overstimulate, desensitise and then shut down the pituitary gland, stopping sex hormone production. In the first 2-4 weeks though, overstimulation causes testosterone overproduction (a "flare up"). Taking 25mg/d Cyproterone Acetate for 2-4 weeks prevents this flare up.

GnRHa Pros, Cons and Side Effects

Pros	Cons
By far the strongest anti-androgens available Doesn't need to be taken as regularly Synarel comes as a nasal spray	Used as puberty blockers Very expensive and many will not be able to get concession rates

Side Effects

Common	Long Term	Rare
Hot flashes, gynecomastia, fatigue, weight gain, fluid retention, erectile dysfunction and decreased libido	Metabolic abnormalities, weight gain, worsening of diabetes and osteoporosis	Bleeding in the pituitary gland (pituitary apoplexy) but only with existing pituitary tumours

GnRHa Tips and Cautions

Tips and Cautions
Please read the CMI for each drug, they all have different instructions, side effects and interactions ● Zoladex must be implanted by a doctor ● Diphereline is an IM injection that must be mixed before injecting ● Lucrin is a dual chamber syringe that mixes before delivery as an IM or SC injection ● Synarel is a nasal spray whose pump must be primed first

Chapter 6

Selective Oestrogen Receptor Modulators

Selective Oestrogen Receptor Modulators (SERMs) are medications that act like oestrogen in some parts of the body and block natural oestrogen in other parts of the body. The most common SERMs are Raloxifene, Tamoxifen and Clomiphene, which are all discussed here.

Note: SERMs are usually used to:

1. Improve bone density for post-menopausal women who have osteoporosis, or;
2. Prevent some types of breast cancer from continuing to grow.

Raloxifene

Raloxifene is a Selective Estrogen Receptor Modulator (SERM), which means that it acts like oestrogen in some parts of the body, and blocks oestrogen in other parts. Raloxifene blocks oestrogen in the brain and breasts but mimics oestrogen in the bones.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Evista FIXTA Raloxifene GH RALOVISTA	Raloxifene hydrochloride	Comes as 60mg tablets that are taken once a day	Yes	Private Prescription: $31.99 - $37.70 Concession: $6.80

How Raloxifene Works

Raloxifene acts similarly to estradiol (E2) in bone cells, where it encourages healthy growth of bone tissue, and maintains bone density. However, Raloxifene blocks natural oestrogen in breast tissue, preventing breast growth.

Raloxifene Pros, Cons and Side Effects

Pros	Cons
Can stop breast growth and helps maintain bone strength	May not be available to trans and gender diverse people, more commonly used for osteoporosis in postmenopausal women, or breast cancer

Side Effects

Common (>1%)	Uncommon (0.1-1%)
Hot flushes, sweating, leg cramps, leg swelling (peripheral oedema) and sleep disorders	Deep vein thrombosis (life threatening blood clots)

Raloxifene Tips and Cautions

Tips	Cautions
Raloxifene's main function in gender affirming hormone therapy (GAHT) is to prevent breast growth while preserving the other feminising effects of oestrogen medications Trans-feminine people will still need oestrogen therapy and testosterone suppression to see other kinds of feminisation	Raloxifene doesn't increase oestrogen levels, oestrogen is still necessary for feminisation Raloxifene is not commonly used in gender affirming hormone therapy, doctors may be hesitant to prescribe it

Tamoxifen

Tamoxifen is a Selective Estrogen Receptor Modulator (SERM), that acts like oestrogen in some parts of the body, and blocks oestrogen in other parts. Tamoxifen blocks oestrogen in the brain and breasts but mimics oestrogen in the bones.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Genox GenRX Nolvadex Tamosin Tamoxifen	Tamoxifen citrate	Come as 20mg tablets, taken once a day	Yes	Private Prescription: $16.99 - $25.75

How Tamoxifen Works

Prevents Breast Growth: In breast tissue, tamoxifen blocks estradiol (E2), which stops natural oestrogen from initiating breast growth.
Improves Bone Health: Just like Raloxifene and natural oestrogen, tamoxifen encourages healthy bone tissue.
Increases Testosterone: Tamoxifen blocks negative feedback to the brain, which stimulates GnRH, which increases sex hormone production, increasing testosterone.

Tamoxifen Pros, Cons and Side Effects

Pros	Cons
Can stop oestrogen causing breast growth and helps maintain bone strength	May increase testosterone levels despite gender affirming hormone therapy and may not be readily available to trans and gender diverse people because it is more commonly used for breast cancer

Side Effects

Common	Uncommon
Weight loss, and hot flashes	Stroke, vision problems, and pulmonary embolism

Tamoxifen Tips and Cautions

Tips	Cautions
Tamoxifen's main function in gender affirming hormone therapy (GAHT) is to prevent breast growth while preserving the other feminising effects of oestrogen medications Trans-feminine people will still need oestrogen therapy and testosterone suppression to see other kinds of feminisation	Tamoxifen doesn't increase oestrogen levels, oestrogen is still necessary for feminisation Tamoxifen is not commonly used in gender affirming hormone therapy, doctors may be hesitant to prescribe it

Clomiphene

Clomiphene is a Selective Estrogen Receptor Modulator (SERM) that acts like oestrogen in some parts of the body, and blocks oestrogen in other parts. Clomiphene is a mixture of two chemicals 1/3rd zuclomiphene and 2/3rds enclomiphene. Zuclomiphene is like a weak form of oestrogen and Enclomiphene is an oestrogen blocker.

Brand Name(s)	Generic Name	Unique Properties	PBS Listed?	Approx Cost
Clomid	Clomiphene citrate	Comes in 50mg pills taken once daily	Yes	Private Prescription: $42.42

How Clomiphene Works

May or May Not Prevent Breast Growth: Because clomiphene is a mixture of two similar chemicals that work differently, it has inconsistent effects on breast tissue. In some people it may prevent some breast growth but Raloxifene and Tamoxifen are more consistent.
Improves Bone Health: Just like Raloxifene and Tamoxifen, clomiphene works like natural oestrogen to encourage healthy bone tissue.
Increases Testosterone: Clomifene blocks negative feedback to the brain, which stimulates GnRH, which increases sex hormone production, increasing testosterone

Clomiphene Pros, Cons and Side Effects

Pros	Cons
May limit breast growth without totally stopping it	Less effective than Raloxifene and Tamoxifen, and worse side effects

Side Effects

Common	Serious (Seek Medical Attention)
Hot flushes, nausea, vomiting, breast discomfort and headache	Blurred vision, visual spots or flashes, double vision, stomach or lower stomach pain, stomach swelling, weight gain and shortness of breath

Clomiphene Tips and Cautions

Tips	Cautions
Clomiphene can be used to prevent breast growth while preserving the other feminising effects of oestrogen medications Trans-feminine people will still need oestrogen therapy and testosterone suppression to see other kinds of feminisation	Clomiphene doesn't increase oestrogen levels, oestrogen is still necessary for feminisation Clomiphene is not commonly used in GAHT, doctors may be hesitant to prescribe it Clomiphene has very serious side effects, and there are safer alternatives

Further Resources

Australian Resources

TransHUB	An NSW based healthcare connection service with information about trans and gender-diverse health care, and a database of NSW healthcare providers (https://www.transhub.org.au/)
Transgender Wiki	This is a community made wiki for gender diverse healthcare in Australia (https://www.reddit.com/r/TransWiki/wiki/index/)
RACGP Suggested Practical Guidelines	This article outlines further recommendations for GPs administering GAHT through the informed consent model of care (https://www1.racgp.org.au/ajgp/2020/july/hormone-therapy-for-trans-and-gender-diverse-patie)
AusPATH Providers	Contains a list of healthcare workers from GPs, surgeons, speech pathologists, psychologists and psychiatrists (https://auspath.org.au/providers)
AusPATH Clinical Practice Guidelines	These are the practice guidelines for GPs that prescribe GAHT. Most doctors will follow these and refer to an endocrinologist for more complex situations/patients. (https://auspath.org.au/wp-content/uploads/2022/05/AusPATH_Informed-Consent-Guidelines_DIGITAL.pdf)

International Resources

Transfeminine Science (USA)	A community-made library of up to date, evidence-based information about GAHT, it also has useful calculators, interactive diagrams and comparisons of different forms of oestrogen (https://transfemscience.org/)
The DIY HRT Directory (USA)	A community-made online DIY guide to GAHT in the USA (https://diyhrt.github.io/)
Gender Dysphoria Bible (USA)	Gives in-depth accounts and explanations of gender incongruence, transitioning and GAHT (https://genderdysphoria.fyi/en/)
Mad Gender Science (USA)	A community-made wiki specifically for trans healthcare (https://madgenderscience.miraheze.org/wiki/Main_Page)

Authour's Note

All information contained within this booklet was derived from publicly accessible guidelines, scientific articles, and the first hand experiences of trans and gender diverse people. The information contained within is current as of June 2023.

The recommendations herein are subject to change pending new position statements by the Australian Medical Association (AMA), new WPATH and/or AusPATH standards of care, new publications by the Royal Australian College of General Practitioners (RACGP), the Royal Children's Hospital Melbourne, Equinox Gender Diverse Health Service, Thorne Harbour Health, Prahran Market Clinic, Northside Clinic, or by any physician associated with these institutions.